



Weather Experiments

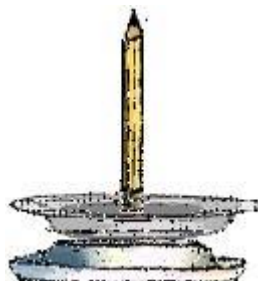
NOAA NATIONAL WEATHER SERVICE

July 2010

Create “Lightning”

MATERIALS:

- Aluminum pie plate
- Styrofoam plate
- Pencil with a new eraser
- Piece of wool cloth
- Thumb tack



PROCESS:

1. Push the thumbtack through the center of the aluminum pie pan from the bottom.
2. Push the eraser end of the pencil into the thumbtack.
3. Put the styrofoam plate upside-down on a table and rub the bottom of the plate briskly with the wool for a couple of minutes.
4. Using the pencil as a handle, pick up the aluminum pie pan and lay it on top of the styrofoam plate.
5. Touch the aluminum pie pan with your finger. You should feel a small shock. If you don't feel anything, try rubbing the styrofoam plate again.
6. Once you feel the shock, turn the lights off and try it again. You should see a spark!!

EXPLANATION:

Why does this happen? It's all about static electricity. Lightning happens when the negative charges, which are called electrons, in the bottom of the cloud or in this experiment your finger are attracted to the positive charges, which are called protons, in the ground or in this experiment the aluminum pie pan. The resulting spark is like a mini lightning bolt.

Make a Cold Front

MATERIALS:

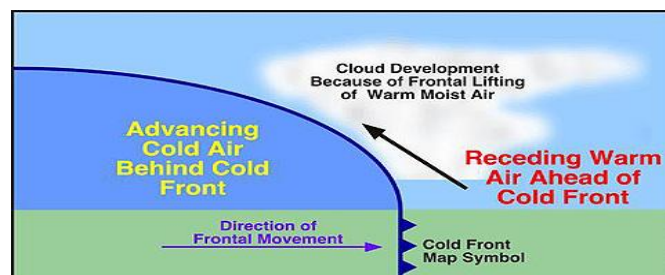
- clear, plastic container (size of shoebox)
- red food coloring
- ice cubes made with blue food coloring

PROCESS:

1. Fill the plastic container two-thirds full with lukewarm water
2. Let the water sit for one minute.
3. Place a blue ice cube at one end of the plastic container.
4. Add three drops of red food coloring to the water at the other end of the container.
5. Watch what happens.

EXPLANATION:

The cold (blue) water sinks while the warm (red) water rises. The blue water represents the cold air mass behind a cold front and the red water represents the warm air mass behind a warm front. A body of warm air is forced to rise by an approaching cold front.



Make Fog

MATERIALS:

- glass jar
- water
- strainer
- ice cubes

PROCESS:

1. Fill the jar completely with hot water and let sit for about a minute.
2. Pour out almost all the water, but leave about one inch in the jar.
3. Put the strainer over the top of the jar and place a few (3-4) ice cubes in the strainer.
4. Watch what happens!

EXPLANATION:

The cold air from the ice cubes mixes with the warm, moist air in the bottle causing the water to condense and form fog.



Cloud in a Bottle

MATERIALS:

- 2-liter clear plastic bottle
- matches
- warm water

PROCESS:

1. Fill the clear plastic 2-liter bottle one-third full of warm water and place the cap on. As warm water evaporates, it adds water vapor to the air inside the bottle. This is the first ingredient to make a cloud.
2. Squeeze and release the bottle and observe what happens. Nothing happens! Why? The squeeze represents the warming that occurs in the atmosphere. The release represents the cooling that occurs in the atmosphere. (If the inside of the bottle becomes covered with condensation or water droplets, just shake the bottle.)
3. Take the cap off the bottle.
4. With adult help, carefully light a match and hold the match near the opening of the bottle.
5. Drop the match in the bottle and quickly replace the cap, trapping the smoke inside. Dust, smoke or other particles in the air is the second ingredient to make a cloud.
6. Once again, slowly squeeze the bottle and release. What happens? A cloud appears when you release and disappears when you squeeze. The third ingredient in clouds is a drop in air pressure.



EXPLANATION:

Water vapor (water in its invisible gaseous state) can be made to condense into the form of small cloud droplets. Adding particles such as the smoke provides a nucleus for the process of water condensation. Squeezing the bottle causes the air pressure to drop, which then creates a cloud!

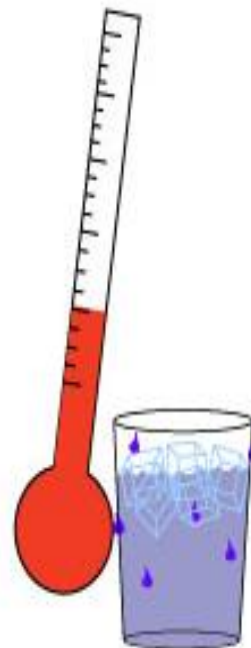
Discover the Dew Point

MATERIALS:

- metal can with label and top removed
- ice cubes
- room-temperature water
- thermometer

PROCESS:

1. Fill the can about halfway with room-temperature water.
2. Make sure the outside of the can is dry.
3. Place the thermometer in the can and record the temperature.
4. Leave the thermometer in the can.
5. Add a few ice cubes and stir.
6. Carefully watch the outside of the can for "sweat" droplets to form.
7. When they do, record the temperature. This is the dew point temperature.
8. Try this experiment under different conditions of humidity and temperature — outside, in a steamy bathroom, etc. The dew point is the temperature at which water vapor in the air condenses to liquid. Does the dew point change under different conditions?



EXPLANATION:

All air contains water vapor. As air cools (when it comes in contact with the cold can), the water vapor begins to condense. This is why glasses holding cold drinks "sweat" in the summertime. The dew point is the temperature at which moisture in the air begins to form dew. The higher the dew point temperature, the higher the moisture content of the air at a given temperature.

On the web:

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